

ADD 'EM UP!

- Objectives: 1) to determine the probability of events  
2) to find a fractional part of a total

Grade Level: Sixth

Materials needed: 2 dice

Directions: Introduce the 2 dice experiment by telling students they are going to toss 2 dice and find the sum of the numbers.

Lead students to agree there will be a number of possible sums (2,3,4,5,6,...10,11,12). List all possible sums on the chalkboard.

Ask students if they think the chances of getting a 2 is the same as a 3,4,5, etc., and tell why they think so.

Together complete the following table on the chalkboard.

Sum	Combination	Total
2	1+1	1
3	1+2, 2+1	2
4	1+3, 3+1, 2+2	3
5	1+4, 4+1, 2+3, 3+2	4
6	1+5, 5+1, 2+4, 4+2, 3+3	5
7	1+6, 6+1, 3+4, 4+3, 5+2, 2+5	6
8	2+6, 6+2, 3+5, 5+3, 4+4	5
9	4+5, 5+4, 3+6, 6+3	4
10	4+6, 6+4, 5+5	3
11	5+6, 6+5	2
12	6+6	1
total possible combinations		36

Lead students to realize the probability of getting a sum of 6,7 or 8 is greater than getting a 2,3,11, or 12.

Tell students they will roll 2 dice a total of 108 times. They will compute for a prediction first:

Prediction =  $\frac{\text{number of combinations for each sum}}{\text{number of possible outcomes (36)}} \times \text{tosses (108)}$

They will then experiment and record results.

Have students make a copy of the following table:

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Probability Experiment Using Two Dice		
Sum	Predicted outcome	Experiment results
2	$\frac{1}{36} \times 108 = 3$	
3	$\frac{2}{36} \times 108 = 6$	
4		
5		
(continue through 12)		

Have students complete chart, experiment, and record.

Extension: Find mean results of the entire class; determine if class results come closer to predicted outcomes than individual results.

Additional related experiment: (more possible outcomes) Use numbers from telephone book, adding the last 2 digits. Follow the same format and plan, but use more than 108 numbers. Have students choose the amount to use.